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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/698,810      | 10/26/2000  | Minco Nomoto         | 16869P-017200       | 6406             |

20350 7590 07/15/2004

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EXAMINER

HESSELTINE, RYAN J

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2623

DATE MAILED: 07/15/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/698,810

**Applicant(s)**

NOMOTO ET AL.

**Examiner**

Ryan J Hesseltine

**Art Unit**

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 20 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 October 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5.6.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election without traverse of species I related to Figure 5, corresponding to claims 5-29, in the reply filed on November 20, 2003 is acknowledged.

### ***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

3. The drawings are objected to because the figure labels for Figures 9-22 have been informally amended (old figure numbers were scratched out and new figure numbers written in by hand). Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any

Art Unit: 2623

required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 17 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 17 recites the limitation "the color video camera" in line 3. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 5-11, 13, 15-20 and 22-27 are rejected under 35 U.S.C. 102(b) as being anticipated by Sakai et al. (JP 11-108759, cited on applicant's IDS, see enclosed translation), hereafter Sakai.

9. Regarding claim 5, Sakai discloses a flaw inspection method by liquid penetrant testing (page 4-5, paragraph 43), comprising: illuminating a surface of a sample to be inspected with polarized light (page 2, paragraphs 12 and 14); obtaining an image of the surface illuminated with the polarized light (page 2, paragraphs 12 and 17); extracting a flaw (defective) candidate

Art Unit: 2623

from the detected image of the surface by processing the obtained image (page 2, paragraphs 11, 13 and 18); and displaying an image of the extracted flaw candidate (page 2, paragraphs 13, 17 and 18).

10. Regarding claims 11 and 24, Sakai discloses a flaw inspection method and apparatus based on flaw testing, comprising: illumination means 12 for illuminating a surface of a sample to be inspected with light (page 2, paragraphs 12 and 14); a color (RGB) video camera 13 for obtaining an image of the surface (page 2, paragraphs 12 and 17); a flaw candidate extraction means for extracting a flaw (defective) candidate from the detected image of the surface by processing the obtained image obtained by said color video camera (page 2, paragraphs 11, 13 and 18); display means 16 for displaying an image of the flaw candidate extracted by said flaw candidate extraction means (page 2, paragraphs 13, 17 and 18); flaw detection means for detecting a flaw from the extracted flaw candidate (page 4, paragraph 38); and memory means 18 for storing an image of the detected flaw by the flaw detection means into memory (page 4, paragraph 40).

11. Regarding claim 19, Sakai discloses a flaw inspection method, comprising: obtaining an image of a surface of an object to be inspected (page 2, paragraphs 12 and 17); detecting a flaw (defect) from the obtained image (page 2, paragraphs 11, 13 and 18; page 4, paragraph 38); displaying the detected flaw image on a screen (page 2, paragraphs 13, 17 and 18); and storing the displayed flaw image in memory 18; wherein the flaw image is displayed on the screen distinguishable from other part of the object (Figure 13; page 4, paragraph 40).

12. Regarding claim 26, Sakai discloses a flaw inspection apparatus based on flaw testing, comprising: a light source 12 which illuminates a surface of a sample to be inspected (page 2,

Art Unit: 2623

paragraphs 12 and 14); a color (RGB) video camera 13 which obtains an image of the surface (page 2, paragraphs 16 and 17); a chromaticity converter which converts a chromaticity of the image obtained by the color video camera by using a conversion coefficient (parameter) which is unique to the video camera (page 2-3, paragraphs 20 and 24); a flaw candidate extractor which extracts a flaw (defective) candidate of the surface from the image obtained by said color video camera which chromaticity is converted by the chromaticity converter (page 2, paragraphs 11, 13 and 18); a display 16 which displays on a screen an image of the extracted flaw candidate which chromaticity is converted (page 2, paragraphs 13, 17 and 18); a flaw detector which detects a flaw from the displayed flaw candidate (page 4, paragraph 38); and a memory 18 which stores an image of the flaw detected by the flaw detector (page 4, paragraph 40).

13. Regarding claims 6, 7 and 17, Sakai discloses that a chromaticity of the obtained image is converted using a parameter, wherein the image is detected using a color video camera and the parameter for converting the chromaticity of the image is unique to the color video camera (page 2-3, paragraphs 20 and 24).

14. Regarding claims 8, 16, 23 and 25, Sakai discloses that display means displays a detected flaw candidate image on a screen together with a positional (location, dimension, area) information (page 4, paragraph 40).

15. Regarding claim 9, Sakai discloses that the positional information is obtained with the image (page 3-4, paragraphs 31-35).

16. Regarding claim 10, Sakai discloses detecting a flaw from the extracted flaw candidate (page 4, paragraph 38); and storing an image of the detected flaw into memory (page 2, paragraph 18; page 4, paragraph 40).

Art Unit: 2623

17. Regarding claims 13 and 20, Sakai discloses that the light illuminating the sample surface is polarized light (page 2, paragraphs 12 and 14).

18. Regarding claims 15 and 22, Sakai discloses that the image is detected by using a color (RGB) video camera (page 2, paragraph 17).

19. Regarding claim 18, Sakai discloses that the image of the flaw candidate is displayed on a screen distinguishable from others (Figure 13; page 4, paragraph 40).

20. Regarding claim 27, Sakai discloses that said chromaticity converter obtains conversion coefficients (parameters) for converting RGB chromaticity values unique to said color video camera into reference xy chromaticity values (page 2-3, paragraphs 20 and 24).

***Claim Rejections - 35 USC § 103***

21. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

22. Claims 28 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai.

23. Regarding claim 28, Sakai discloses a flaw inspection method using an object to be inspected, comprising: obtaining an image of a surface of the object (page 2, paragraphs 16 and 17); converting a chromaticity of the obtained image to extract a flaw candidate (page 2-3, paragraphs 18, 20 and 24); detecting a flaw from the extracted flaw candidate (page 4, paragraph 38); and displaying the detected flaw image on a screen (page 2, paragraphs 13, 17 and 18). Sakai does not explicitly disclose a computer memory storing code for performing the above method steps, but this would have been obvious in light of Sakai's disclosure. For example,

Art Unit: 2623

Sakai discloses a computer 14 that performs color measurement of an inspection object and defective detection (page 2, paragraph 17). It would have been obvious to one of ordinary skill in the art at the time the invention was made to perform the above method steps by storing code (program instructions) on a computer memory in order to instruct a computer to execute the method.

24. Regarding claim 29, Sakai discloses a computer memory storing code (see above discussion of claim 28) for a flaw inspection method using an object to be inspected, wherein said computer memory comprises: code for obtaining an image of a surface of the object (page 2, paragraphs 16 and 17); code for converting a chromaticity of the obtained image; code for displaying on a screen an image of the object which chromaticity is converted from the obtained image (page 2-3, paragraphs 18, 20 and 24); code for indicating a flaw candidate on the screen (page 4, paragraphs 37 and 38); and code for displaying a flaw image on a screen detected from the candidate (page 4, paragraph 40).

25. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai as applied to claim 11 above.

26. Regarding claim 12, Sakai does not explicitly disclose re-displaying the stored flaw image, but it is disclosed that the information on all images is collected and stored to be examined by the user who can pull out data from an image with an ID number of the product to further inspect the part (page 4, paragraphs 40-41). It would have been obvious to one of ordinary skill in the art at the time the invention was made to re-display the stored flaw image as



Art Unit: 2623

taught by Sakai in order to allow a user to perform a detailed inspection of a part after an image of the part has stored (page 4, paragraph 41).

27. Claims 14 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakai as applied to claims 11 and 19 above, and further in view of Gillard et al. (USPN 5,570,431, newly cited), hereafter Gillard.

28. Regarding claims 14 and 21, Sakai does not disclose that the light illuminating the sample surface is ultra violet light. Gillard discloses a process and apparatus for automatically characterizing, optimizing and checking a crack detection analysis method including an ultra violet light source illuminating the sample surface (column 4, line 6-19). It would have been obvious to one of ordinary skill in the art at the time the invention was made to illuminate the sample surface with ultra violet light as taught by Gillard in order to provide illumination adapted and optimized for fluorescent crack detection (column 2, line 59-67) using indicator products giving a very high contrast between crack indication and the article surface (column 3, line 54-63).

### ***Conclusion***

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. USPN 4,648,053 to Fridge discloses a high speed optical inspection system including illuminating a sample with high intensity lamps and filtering the incident light and reflected light such as by cross polarization for contrasting. USPN 5,301,248 to Takanori et al. discloses a method and apparatus for pattern inspection including a polarizing light radiation system. USPN 5,625,193 to Broude et al. discloses an optical inspection system and method for detecting flaws

Art Unit: 2623

on a diffractive surface including an ultraviolet illumination means and determining flaw location and size and displaying the locations of detected flaws. USPN 6,683,641 to MacCracken et al. discloses an apparatus for inspecting the interior of hollow articles including an ultraviolet light source. USPN 6,697,514 to Kobayashi et al. discloses an apparatus for inspecting a fluorescent substance on a plasma display utilizing a UV light source.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ryan J Hesseltine whose telephone number is 703-306-4069. The examiner can normally be reached on Monday - Friday, 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Ryan J. Hesseltine  
July 9, 2004



JINGGE WU  
PRIMARY EXAMINER